



1

Search UI Reading Group

- What's this for?
- DL
- Big topic
 - Goals: gaps & blank spaces for new research
 - What's interesting?
- Next few meetings...

2

Alternative Search UIs

Mark Hallett
Microsoft Research

3

Outline

- Today: search UI & contextual intent
- User interface issues
 - Information search
 - Query generation
 - Result presentation & interaction
 - Customization
 - Collaborative searching tools
- Research opportunities & research agenda

Search UI Reading Group

- What's this for?
- DL
- Big topic
 - Goals: gaps & blank spaces for new research
 - What's interesting?
 - Faceted search
 - Temporal issues
 - Pictures/vertical search
 - Heterogeneous info
 - Personalized search
- Next few meetings...

Click to add notes



Search UI Reading Group

- What's this for?
- LIL
- Big topic
 - Goals: gaps & blank spaces for new research
 Taxonomy of search issues & open for spec
 - What's interesting?
 - Focused search
 - Temporal issues
 - Picture / visual search
 - Heterogeneous info
 - Personalized search
 - Personalized categories leveraged for global search (delicious, technorati)
 - Contextualized search (state of machine, season)
 - More general than search: query-driven UI—sharing, notifications, search subscriptions, standing queries
 - Visualization of search results
 - Specific focused problem-space discussion, working groups, etc.
 - Show & tell
 - Metrics for studying & evaluating search UI (usability, etc)
 - Search UI for VERY LARGE databases
- Next few meetings

Alternative Search UIs

Susan Dumais

Microsoft Research

Alternative Search UIs

Susan Dumais

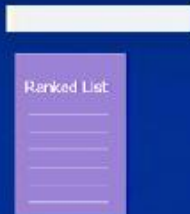
Microsoft Research

Outline

- Today, search UI is consistent and limited
- User interface issues
 - Information need
 - Query specification
 - Results presentation and evaluation
 - Query refinement
 - Collecting and organizing results
- Note: lots of prototypes/systems, less research

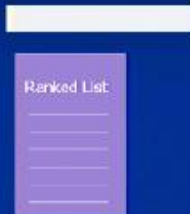
“Typical” Web Search Experience

- Simple query box
- List of 10-20 items returned
 - Title, contextual summary, URL



“Typical” Web Search Experience

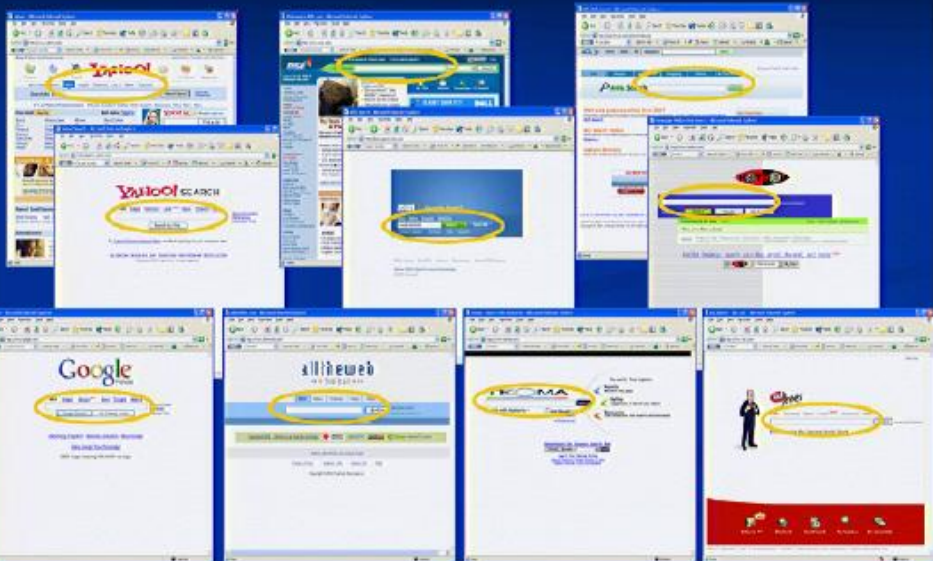
- Simple query box
- List of 10-20 items returned
 - Title, contextual summary, URL
- Then ...
 - Follow a result link
 - [Perhaps, next/previous results]
 - [Perhaps, advanced search criteria, find within, or find similar]
 - Or, try another query



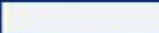
Information Need

- Wide spectrum of user needs (from Broder'02, Rose'04):
 - Informational – find out about [e.g., *history of space travel*]
 - Navigational – get to key page [e.g., *espn, susan dumais*]
 - Transactional – buy or do something [e.g., *download music*]
 - Question Answering – specific fact [e.g., *diameter of the earth*]
- Different needs may require:
 - Different ranking, query specification or results presentation
 - General web search, Meta-search, Specialty/Vertical search (news, images, shopping), Directories (browsing)
 - Perhaps, additional support for using results
 - Bates's "berry-picking" ideas
 - Store intermediate results, make comparisons, identify trends, etc.

Query Specification, Jan 05



Query Specification

- Simple query box ... type some words 
 - Also, Phrase “”, Include +, Exclude -, AND, OR
 - Operators seldom used (<10%), so get the defaults right
 - Early engines used OR, now use AND
 - Stop words usually ignored; Proximity usually
 - How much additional query normalization to do?
Most do very little ... tho note anchor text
 - Advanced features usually hidden
 - Customization
- Some modifications
 - Larger query boxes
 - Richer NLP analysis of queries

Queries in Context

■ Deskbar



■ Application add-ins



Alt Query Specification

- Infer query type (e.g., *Google, Yahoo*)
- Queries by selection (e.g., *Office 2003, Bookmarklets, Golovchinsky Xlibris, VOIR*)
- Implicit queries (e.g., *Dumais IQ, Rhodes Remeberance Agent, Budzik Watson, Autonomy Kenjin, Blinkx, Community Bar*)
 - “Query-free” retrieval
 - Several types of related info

Queries in Context

■ Deskbar



■ Application add-ins

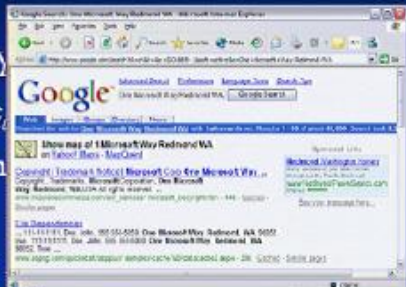


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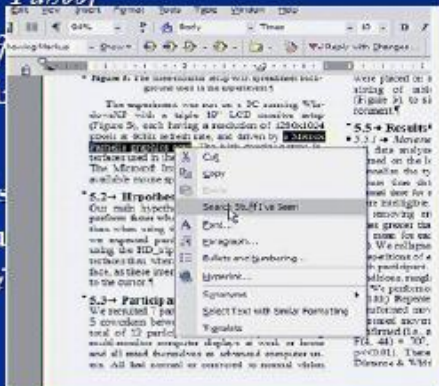
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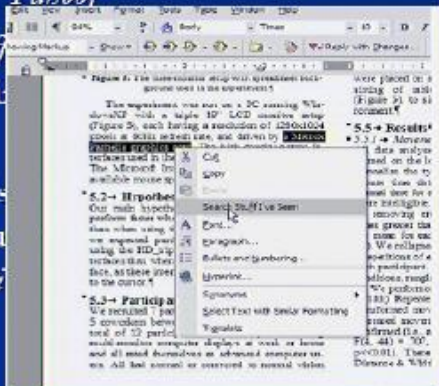
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Figure 2: The entire XLibris display shows an annotated document page

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 - “Qu Mike Lynch, CEO of Autonomy, said the technology will remove the
 - Scve need for search engines. “Typing keywords into search engines will seem as ridiculous as hand cranking a car in a few years time,” he said.

Query Refinement

- Search within results
- Suggested queries
 - Spelling suggestions ... details matter
 - Synonyms
 - Other queries (AltaVista Prisma SIGIR'03, AllTheWeb, TMSN)
 - Google suggests (real-time), earlier SimpliFind
- Suggested refinements
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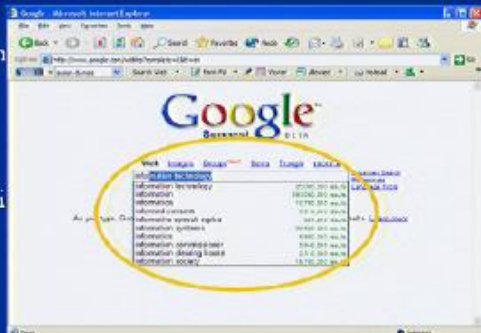
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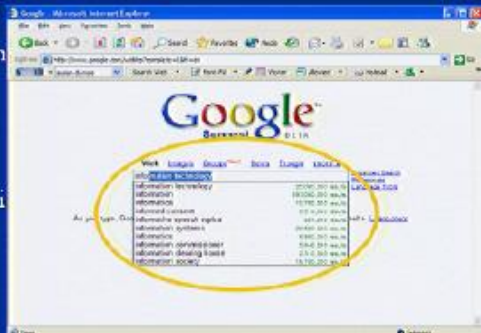
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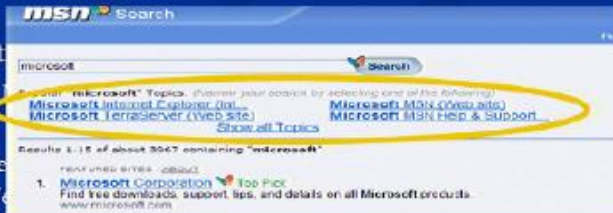
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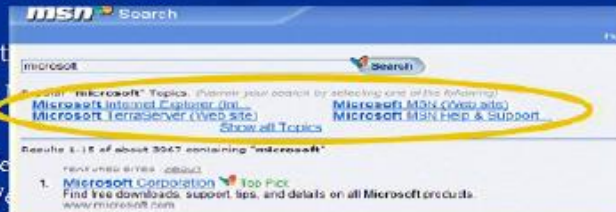
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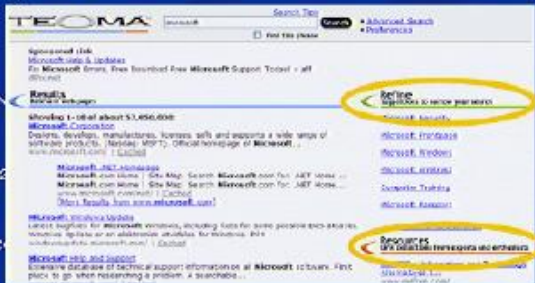
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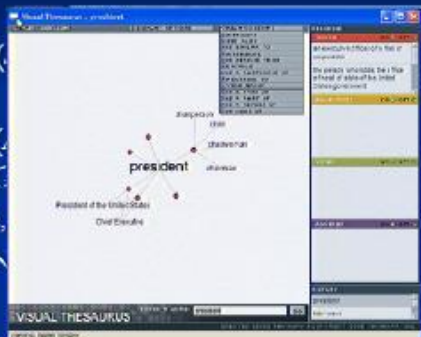


Query Refinement, cont'd

- Interactive query disambiguation (*SimpliFind*, *Oingo*)
- Inter-relationships among words (*AltaVista*, *TextArc*, *Visual Thesaurus*, *QueryGraph*)
 - Sources of relations – content, usage, external
- Control of query parameters (*MSN Search Builder*)
- Relevance feedback
 - Query independent, “similar pages” (Google)
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 - Even richer notions of feedback in IR (mark some results as +/- ... works well in the lab)
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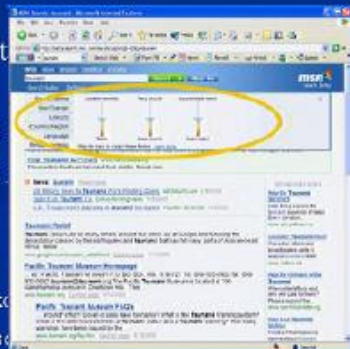
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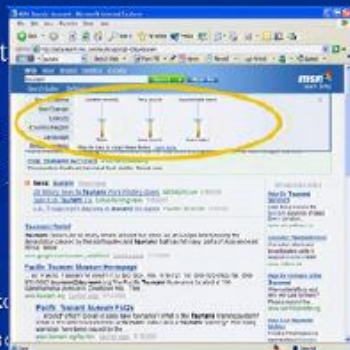
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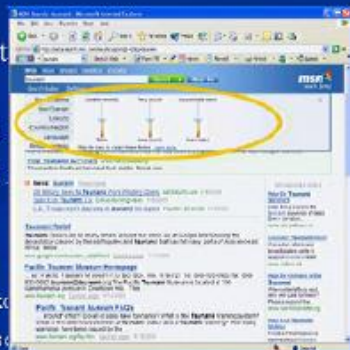


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Results Presentation

- List of results w/ Page summaries
 - Title, Query-relevant summary, URL
 - Perhaps ... Relevance score, time, size, language, thumbnail (*Twinkl*, *Google*, *Dziadosz/Chandrasekar*)



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- Combining Results List w/ Pages
 - Same window, Multiple windows, Frames (*SpotOn*, *IE*)
 - Inline *Fagg*, Belkin studies
 - Tabbed *Springu' Google*
 - Selectively showing information, e.g., Tooltips or Fluid documents *PARC*, *Wave Lens* (Paek, Dunais)
 - *GoogleViewer Google Labs*

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 - Perhaps ... Relevance score, time, size, language, thumbnail (*Twinkl*, *Google*, *Dziadosz/Chandrasekar*)
- Combining Results List w/ Pages
 - Same window, Multiple windows, Frames (*SpotOn*, *IE*)
 - Inline *Faggle*, Belkin studies
 - Tabbed *Springin' Google*
 - Selectively showing information, e.g., Tooltips or Fluid documents *PARC*, *Wave Lens* (Paek, Dunais)
 - *GoogleViewer Google Labs*

Results Presentation

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Figure 1. Interface for information profiles visualization, with multiple document displays

Results Presentation

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- *Google Viewer* *Google Labs*



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■ List of results w/ Page summaries

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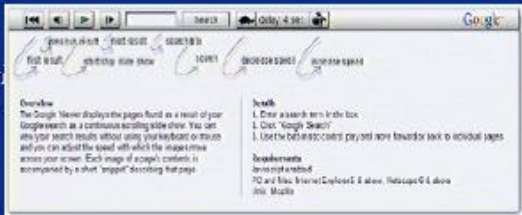
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 - *Wave Lens* (Paek, Dumais)
 - *GoogleViewer* *Google Labs*



Alt Results Presentation

■ Showing Multiple Pages with Different Emphasis

- Tiling (Bharat *Krakatoa Chronicle*, Golovinshky *VOIR*, Pack *Pyra*)
- Combining different sources (Anderson/Horwitz *Web Montage*, *QuickBrowse*)

■ Highlighting matches

- Key word in context (KWIC)
- Word distributions (Hearst *Tilebars*, Eick *SeeSoft*, thumbnails)
- Enhanced thumbnails (Woodruff, Baudish *FishNet* –task dependency of linear, overview, fishnet views)



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Figure 4. Example of the Krakatoa Chronicle screen

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Figure 4. Example of the Krakatoa Chronicle screen

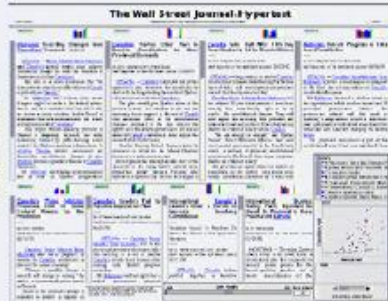
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- Combining different sources (Anderson/Horwitz *Web Montage*, *QuickBrowse*)

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Figure 4. Example of the Krakatoa Chronicle screen

Alt Results Presentation

■ Showing Multiple Pages with Different Emphasis

- Tiling (Bharat *Krakatoa Chronicle*, Golovinshky *VOIR*, Pack *Pyramix*)
- Combining different sources (Anderson/Horwitz *Web Montage*, *QuickBrowse*)

■ Highlighting matches

- Key word in context (KWIC)
- Word distributions (Hearst *Tilebar*, *SeeSoft*, thumbnails)
- Enhanced thumbnails (Woodruff *FishNet* – task dependency or linear, overview, fishnet views)



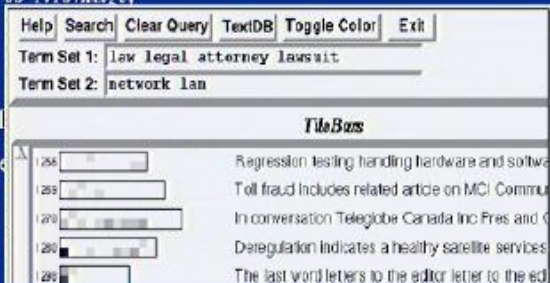
Alt Results Presentation

■ Showing Multiple Pages with Different Emphasis

- Tiling (Bharat *Krakatoa Chronicle*, Golovinshky *VOIR*, Pack *Pyramid*, *A9*)
- Combining different sources (Anderson/Horvitz *Web Montage*, *QuickBrowse*)

■ Highlighting matches

- Key word in context (I)
- Word distributions (H
SeeSoft, thumbnails)
- Enhanced thumbnails
Baudish FishNet –task
linear, overview, fishnet views)



Alt Results Presentation

- Showing Multiple Pages with Different Emphasis
 - Tiling (Bharat *Krakatoa Chronicle*, Golovinshky *VOIR*, Pack *Pyramid*, *A9*)
 - Combining different sources (Anderson/Horvitz *Web Montage*, *QuickBrowse*)
- Highlighting matches
 - Key word in context (KWIC)
 - Word distributions (Hearst *Tilebars*, Eick *SeeSoft*, thumbnails)
 - Enhanced thumbnails (Woodruff, Baudish *FishNet* –task dependency of linear, overview, fishnet views)

Alt Results Presentation

■ Showing Multiple Pages with Different Emphasis

- Tiling (Bharat *Krakatoa Chronicle*, Golovinshky *VOIR*, Pack *Pyramid*, *A9*)
- Combining different sources (Anderson/Horwitz *Web Montage*, *QuickBrowse*)

■ Highlighting matches

- Key word
- Word dist
- *SeeSoft*, the
- Enhanced
- Baudish P
- linear, over view, linked views)



(a)



(b)



(c)

Alt Results Presentation

■ Showing Multiple Pages with Different Emphasis

- Tiling (Bharat *Krakatoa Chronicle*, Golovinshky *VOIR*, Pack P)
- Combining different sources (Anderson/Horwitz *Web M*, *QuickBrowse*)

■ Highlighting matches

- Key word in context (KWIC)
- Word distributions (Hearst *SeeSoft*, thumbnails)
- Enhanced thumbnails (Wood *Baudish FishNet* – task dependent, linear, overview, fishnet view)

fishnet



Alt Results Presentation

■ Showing Multiple Pages with Different Emphasis

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- Word distributions (Hearst, *SeeSoft*, thumbnails)
- Enhanced thumbnails (Wood, Baudish *FishNet* – task dependent, linear, overview, fishnet view)

fishnet



Alt Results Presentation

■ Integration with Metadata

- Sort/Filter by attributes (Ahlberg *Dynamic Queries*, Dumas et al. *SIS*, Fishkin *MagicLens + Dynamic Queries*, Shafer & Agrawal, *Grokker*)
 - SIS experience, short query and iterate
- Tabular views for organization, sorting, etc. (Fox et al. *Envision*, Rao & Card *TableLens*, Goecks et al. *GridVis*, Baldonado et al. *Sensemaker*)
- Results in metadata context (Egan et al. *SuperBook*, Hearst et al. *ChaCha*, Maarek et al. *Mappuccino*, Hearst and Karadi *Cat-A-Cone*)
- Multiple categories or faceted metadata ... more to come (MeSH, Pollitt *HiBrowse*, Hearst *Flamenco*, Lee et al. *PaperLens*)

Alt Results Presentation

Integration with Metadata

- Sort/Filter by attributes (Ahlberg et al. *Dynamic Queries*, Dumas et al. *SIS*, l'ishkhanov et al. *Dynamic Queries*, Shafer & Agrawal)
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[illegible]

Alt Results Presentation

■ Integration with Metadata

- Sort/Filter by attributes (Alderson et al. *Dynamic Queries*, Dumais et al. *SIS*, Dumais et al. *Dynamic Queries*, Shafer & Shinkoff)
 - SIS experience, short of
- Tabular views for organization (Fox et al. *Envision*, Rao & Goecks et al. *GridVis*, Balakrishnan et al. *Sensemaker*)
- Results in metadata context (Lagan et al. *SuperBook*, Hearst et al. *ChoCha*, Maarek et al. *Mappuccino*, Hearst and Karadi *Cat-A-Cone*)
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Alt Results Presentation

■ Integration with Metadata

- Sort/Filter by attributes (Ahlberg *Dynamic Queries*, Dumas et al. *SIS*, Fishkin *MagicLens + Dynamic Queries*, Shafer & Agrawal, *Grokker*)
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- Results in metadata context (Egan et al. *SuperBook*, Hearst et al. *ChoCha*, Maarek et al. *Mappuccino*, Hearst and Karadi *Cat-A-Cone*)
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Alt Results Presentation

Integration with Metadata

- Sort/Filter by attributes (Ahlberg *et al.* *Queies*, Dumais *et al.* *SIS*, Fishkin *et al.* *Dynamic Queries*, Shafer & Agrawal)
 - SIS experience, short query and
- Tabular views for organization, sort (Fox *et al.* *Envision*, Rao & Card *et al.* *GridVis*, Goecks *et al.* *GridVis*, Baldonado *et al.* *Sensemaker*)
- Results in metadata context (Egan *et al.* *SuperBook*, Hearst *et al.* *ChaCha*, Mappuccino, Hearst and Karadi *Cat-*
- Multiple categories or faceted meta more to come (*MeSH*, Pollitt *et al.* *HiBro*, Flamenco, Lee *et al.* *PaperLens*)

The screenshot shows a Windows XP desktop with a calendar application open. The calendar is for the month of April 2005. The left sidebar shows a list of people, including 'All People' and 'Topics'. The main area displays a calendar grid with events for various people. A tooltip is visible over the date April 11, 2005, showing details for 'Topic: Planning Meeting (11:00 AM)'.

Calendar Application Interface:

- Top Bar:** Shows the date 'Wed 10/4/05' and a search bar.
- Left Sidebar:**
 - New type:** All People
 - Category:** Topic
 - Topics:** A list of topics including 'Topic: Planning Meeting (11:00 AM)', 'Topic: Planning Meeting (11:00 AM)', 'Topic: Planning Meeting (11:00 AM)', etc.
- Main Calendar Area:**
 - Month View:** Shows a grid of days for April 2005. Events are listed for various people, including 'Topic: Planning Meeting (11:00 AM)', 'Topic: Planning Meeting (11:00 AM)', 'Topic: Planning Meeting (11:00 AM)', etc.
 - Day View:** Shows a detailed view of the selected day (April 11, 2005). The event 'Topic: Planning Meeting (11:00 AM)' is highlighted.

Alt Results Presentation

■ Integration with Metadata

- Sort/Filter by attributes (Ahlberg *Dynamic Queries*, Dumais et al. *SIS*, Fishkin *MagicLens* + *Dynamic Queries*, Shafer & Agrawal, *Grokker*)
- SIS experience, short query and iterate

- Tabular views for organization (Fox et al. *Envision*, Rao & Goecks et al. *GridVis*, *Sensemaker*)

- Results in metadata context (*SuperBook*, Hearst et al. *Mappuccino*, Hearst and

- Multiple categories or filters more to come (*MeSH*, *Flamenco*, Lee et al. *Paper*

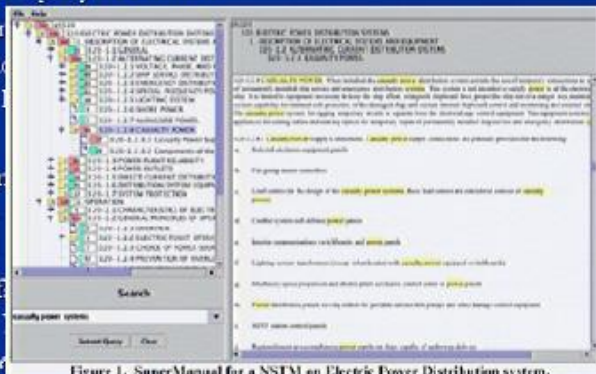


Figure 1. SuperManual for a NSTM on Electric Power Distribution system.

Alt Results Presentation

Integration with Metadata

- Sort/Filter by attributes (Ahlberg *Dynamic Queries*, Dumais et al. *SIS*, Fishkin *MagicLens + Dynamic Queries*, Shafer & Agrawal, *Grokker*)
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 - Multiple categories or faceted more to come (*MeSH*, Pollitt *Flamenco*, Lee et al. *PaperLens*)
- 
- The screenshot shows the 'Flamenco' application window. It features a sidebar on the left with a search bar and a list of items. The main area displays a table of items with columns for 'Name', 'Location', and 'Date'. The items are listed with their names, locations, and dates. The interface is designed for browsing and filtering data.
- Figure 2: Middle ground



Alt Results Presentation

Integration with Metadata

- Sort/Filter by attributes (Ahlberg *Dynamic Queries*, Dumais et al. *SIS*, Fishkin *MagicLens* + *Dynamic Queries*, Shafer & Agrawal, *Grokker*)
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Alt Results Presentation (Google – Categories and Results)



Alt Results Presentation

Integration with Metadata

- Sort/Filter by attributes (Ahlberg *Dynamic Queries*, Dumais et al. *SIS*, Fishkin *MagicLens* + *Dynamic Queries*, Shafer & Agrawal, *Grokker*)
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- Tabular views for organizations (Fox et al. *Envision*, Rao & Card, *GridVis*, Baldane *Sensemaker*)

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Alt Results Presentation (Google – Categories and Results)



Alt Results Presentation

(Google – Categories and Results)



Alt Results Presentation (Google – Categories and Results)

The image displays three overlapping screenshots of a Google search for the term "usability" using Microsoft Internet Explorer. The browser's address bar shows the search URL: <http://www.google.com/search?q=usability&btnG=Google+Search>.

Left Screenshot: Shows the "Web" category selected. The results list includes:

- usability Experts** - www.usability.com - Design and usability experts...
- User Interface Conference** - www.ui-conference.com - Usability and usability experts...
- usability** - www.usability.com - Design and usability experts...
- usability** - www.usability.com - Design and usability experts...
- usability** - www.usability.com - Design and usability experts...

Middle Screenshot: Shows the "Groups" category selected. The results list includes:

- usability Experts** - www.usability.com - Design and usability experts...
- User Interface Conference** - www.ui-conference.com - Usability and usability experts...
- usability** - www.usability.com - Design and usability experts...
- usability** - www.usability.com - Design and usability experts...
- usability** - www.usability.com - Design and usability experts...

Right Screenshot: Shows the "All" category selected. The results list includes:

- usability** - www.usability.com - Design and usability experts...
- usability** - www.usability.com - Design and usability experts...
- usability** - www.usability.com - Design and usability experts...
- usability** - www.usability.com - Design and usability experts...
- usability** - www.usability.com - Design and usability experts...

Alt Results Presentation

- Grouping ... hide similar results to summarize multiple pages

- Attributes (e.g., group by host)
- Classification/Categorization (*Northern Light*, Dumais et al. *SWTSH*, lots of others)
- Clustering (Cutting et al. *Scatter-Gather*, Zamir & Etzioni *Grouper*, RamanC *Grouper*, *Vivisimo*)

Microsoft Corporation

The only page to Microsoft's Web site. Find software, solutions, answers, support, and Microsoft news. Microsoft Home. All Products ...

Description: Official homepage of Microsoft Corporation

Category: Computers > Companies > ... > Microsoft Corporation

[www.microsoft.com](#) - 26K - Jul 13, 2003 - [Cached](#) - [Similar pages](#) - [Block source: MSN](#)

Internet Explorer Home Page

Microsoft Internet Explorer provides the most private, reliable

and flexible Internet browsing experience ... Microsoft.com home ...

[www.microsoft.com/ie/default.asp](#) - 66K - Jul 13, 2003 - [Cached](#) - [Similar pages](#)

[[View results from www.microsoft.com](#)]

Welcome to MSN.com

... MSN Affiliate Program MSN Alerts MSN Direct Watches MSN Member Center MSN Messenger

MSN as your Call Center Try MSN TV, Free Microsoft Microsoft Products Office ...

Description: Setup access & content provider

Category: Computers > Internet > ... > United States > Web > web2.0

[www.msn.com](#) - 28K - Jul 13, 2003 - [Cached](#) - [Similar pages](#)

Alt Results Presentation

(Google – Categories and Results)

Alt Results Presentation (Google – Categories and Results)

The image displays three overlapping screenshots of Google search results for the term "usability" in Microsoft Internet Explorer. The leftmost window shows the search results page with "usability" highlighted in the search bar and in the first search result. The middle window shows a "Top Sites" sidebar with "usability" highlighted in the sidebar and in the main results. The rightmost window shows a "Top Sites" sidebar with "usability" highlighted in the sidebar and in the main results.

Leftmost Window (Search Results):

- Search bar: **usability**
- Search results: **usability**
- Search results: **usability**

Middle Window (Search Results):

- Search bar: **usability**
- Search results: **usability**
- Search results: **usability**

Rightmost Window (Search Results):

- Search bar: **usability**
- Search results: **usability**
- Search results: **usability**

Alt Results Presentation

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 - Attributes (e.g., group by host)
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Alt Results Presentation

- Grouping ... hide similar results to summarize multiple pages

amazon.com View Cart | Help

Aug 2003

INTERNATIONAL | TOP ALL LINKS | TARGET | About a vendor | Help | More

Search: **harry potter**

☐ Amazon.com ☐ eBay

Books: 25 results

- **Harry Potter and the Prisoner of Azkaban (Book 3)** -- J. K. Rowling, Mary GrandPré (Illustrator), Hardcover
- **Harry Potter and the Sorcerer's Stone (Book 1-4)** -- J. K. Rowling, Mary GrandPré (Illustrator), Hardcover
- **Harry Potter and the Chamber of Secrets (Book 2)** -- J. K. Rowling (Author), Hardcover

DVDs: 25 results

- **Harry Potter and the Sorcerer's Stone (Widescreen Edition)** (2001) -- Daniel Radcliffe, DVD Custom
- **Harry Potter and the Sorcerer's Stone (Full Screen Edition)** (2001) -- Daniel Radcliffe, DVD Custom
- **Harry Potter and the Chamber of Secrets (Widescreen Edition)** (2002) -- Daniel Radcliffe, DVD Custom

Sponsored Link [amazon.com](#)

Harry Potter's World
Is more of Italy - See the handmade Italy Plant from Alice's new [www.alices.com](#)

Video: 25 results

amazon.com View Cart | Help

Jan 2005

INTERNATIONAL | TOP ALL LINKS | TARGET | About a vendor | Help | More

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☐ Amazon.com ☐ eBay

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Sponsored Link [amazon.com](#)

Harry Potter's World
Is more of Italy - See the handmade Italy Plant from Alice's new [www.alices.com](#)

Video: 25 results

Alt Results Presentation

■ Showing rich connections among search results

- Spaced *Infocrystal*, Korfhage *VTBE*
- Maps – Kohonen *KohonenMaps*, Wise et al. / *Cartia ThemeScape*, *BrainEKP*, *Correlate K-Map*, *Personal Brain*, *SemioMap*, *TG Link Browser*, *ThinkMap*, *DataMountain*, *Grokker*, *Kartoo*
- Links and Networks - Carriere & Kazman *WebQuery*, *TreeMap*, *Cat-A-Cone*, *InfoCube*, *Perspective Wall*, *Insight Hyperbolic Browser*, *AltaVista's Concept Map*
- Others (3d, images) - Mukherjee *Amore*, *OpenDirectory vizualization Map.Net*, *10by10*

Alt Results Presentation

■ Grouping ... hide similar results to summarize multiple pages

- Attributes (e.g., group by host)

- Classification/Categorization
(*Northern Light*, Dumais et al.
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- Clustering (Cutting et al.
Catber, Zamir & Etzioni
RamanC Grouper, *Vivisimo*)

The screenshot shows the Vivisimo search engine interface. At the top, there is a search bar with the query 'jaguar' and a 'Search' button. Below the search bar, there are links for 'Advanced Search', 'Stats', and 'Zotero, What You Think'. The main content area is titled 'Top 200 documents retrieved for the query jaguar'. It displays a list of search results, each with a title, a snippet, and a link to the document. The results are grouped by host, with the first group being 'jaguar.com'. The second group is 'www.jaguar.co.uk'. The third group is 'www.jaguar.co.uk'. The fourth group is 'www.jaguar.co.uk'. The fifth group is 'www.jaguar.co.uk'. The sixth group is 'www.jaguar.co.uk'. The seventh group is 'www.jaguar.co.uk'. The eighth group is 'www.jaguar.co.uk'. The ninth group is 'www.jaguar.co.uk'. The tenth group is 'www.jaguar.co.uk'. The eleventh group is 'www.jaguar.co.uk'. The twelfth group is 'www.jaguar.co.uk'. The thirteenth group is 'www.jaguar.co.uk'. The fourteenth group is 'www.jaguar.co.uk'. The fifteenth group is 'www.jaguar.co.uk'. The sixteenth group is 'www.jaguar.co.uk'. The seventeenth group is 'www.jaguar.co.uk'. The eighteenth group is 'www.jaguar.co.uk'. The nineteenth group is 'www.jaguar.co.uk'. The twentieth group is 'www.jaguar.co.uk'. The results are grouped by host, with the first group being 'jaguar.com'. The second group is 'www.jaguar.co.uk'. The third group is 'www.jaguar.co.uk'. The fourth group is 'www.jaguar.co.uk'. The fifth group is 'www.jaguar.co.uk'. The sixth group is 'www.jaguar.co.uk'. The seventh group is 'www.jaguar.co.uk'. The eighth group is 'www.jaguar.co.uk'. The ninth group is 'www.jaguar.co.uk'. The tenth group is 'www.jaguar.co.uk'. The eleventh group is 'www.jaguar.co.uk'. The twelfth group is 'www.jaguar.co.uk'. The thirteenth group is 'www.jaguar.co.uk'. The fourteenth group is 'www.jaguar.co.uk'. The fifteenth group is 'www.jaguar.co.uk'. The sixteenth group is 'www.jaguar.co.uk'. The seventeenth group is 'www.jaguar.co.uk'. The eighteenth group is 'www.jaguar.co.uk'. The nineteenth group is 'www.jaguar.co.uk'. The twentieth group is 'www.jaguar.co.uk'.

Alt Results Presentation

■ Grouping ... hide similar results to summarize multiple pages

- Attributes (e.g., group by host)

- Classification/Categorization
(*Northern Light*, Dumais et al.
SWISH, lots of others)

- Clustering (Cutting et al.
Catber, Zamir & Etzioni
RamanC Grouper, *Vivisimo*)

The screenshot shows the Vivisimo search engine interface. At the top, the Vivisimo logo is on the left, and a search bar with the text 'jaguar' is on the right. Below the search bar, there are links for 'Advanced Search', 'Stats', and 'Tutorials/FAQ/About'. A yellow banner below the search bar reads 'Top 253 documents retrieved for the query jaguar'. On the left side, there is a 'Clustered Results' section with a list of clusters, each with a small icon and a count in parentheses. The clusters listed are: 'jaguar (174)', 'Facts (2)', 'saw (1)', 'Type (0)', 'Jaguar Cars (10)', 'Units, Events (4)', 'Bac 05.1 (1)', 'Destinations (4)', 'Gates, Jailer (17)', 'Gates (4)', 'Jag (1)', and 'Jaguar'. The main content area on the right displays the top 253 documents. The first document is titled 'F1 Tickets and Schedule Information' and is from 'www.pennmotorsports.com'. The second document is titled 'Buy Jaguar Tickets On SeatGuru, Huge Selection' and is from 'www.seatguru.com'. The third document is titled 'Jaguar: Official Site' and is from 'www.jaguar.com'. The fourth document is titled 'www.jaguar.co.uk' and is from 'www.jaguar.co.uk'.

Alt Results Presentation

■ Showing rich connections among search results

- Spaced *Infocrystal*, Korfhage VT
- Maps – Kohonen *KohonenMaps*, al. / *Cartia ThemeScape*, *BrainEK*, *Correlate K-Map*, *Personal Brain*, *SemioMap*, *TG Link Browser*, *The DataMountain*, *Grokker*, *Kartoo*
- Links and Networks - Carriere & Kazman *WebQuery*, *TreeMap*, *Cat-A-Cone*, *InfoCube*, *Perspective Wall*, *Insight Hyperbolic Browser*, AltaVista's *Concept Map*
- Others (3d, images) - Mukherjee *Amore*, OpenDirectory visualization *Map.Net*, *10by10*



Figure 3.1 shows how we can transform a Venn diagram into an iconic display, called the *Infocrystal*.

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Results Personalization

- Personalization (user) / Contextualization (task)
- User model
 - Explicit vs. Implicit
 - Content, Geo, Style ...
- Used to
 - Modifying queries
 - Ordering of pages - Select different results, Re-order results, Highlight results (e.g., Dumais/Teevan)
 - Richer presentation - Graham *Reader'sHelper*, Milic-Frayling *MSRead*

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Using Search Results

- Preserve search history
 - Milic Frayling *MSRead*,
Bederson *PadPrints*
- Gather information
 - MSN save results feature, now
defunct
 - Bharat *SearchPad*
 - *iLar*
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Figure 9. An *AtaVista*

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Figure 9. An AltaVista result page extended with SearchPad's uncor

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Figure 9. An Abalite

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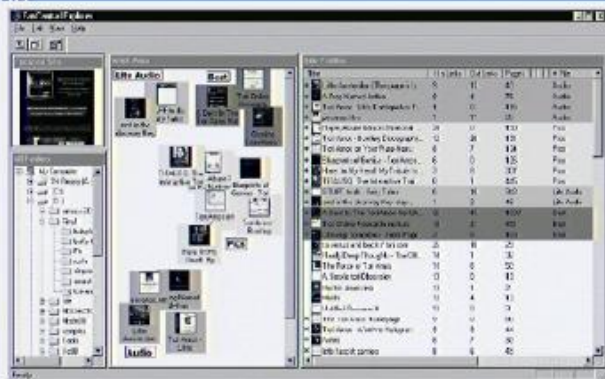


Figure 3: ToxicShore Explorer (version 2)

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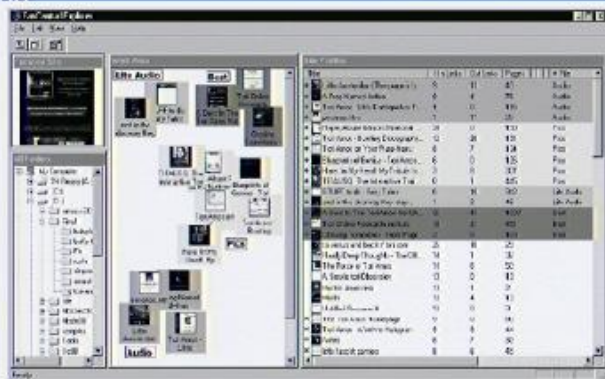


Figure 3: ToxicShoe Explorer (version 2)

Miscellany

- Where the work happens
 - Server vs. Client (toolbar or richer tools)
 - E.g., Toolbar – search anywhere, search site, navigate site, highlight search terms, jump to next match, page ranks, inlinks,
- Integrating multiple types of results (single list, tabs)
 - Web pages, Categories, News, Specialized information (e.g., stock quotes, phone numbers, maps), Advertisements, Personal content
- Multiple attribute (facets) of results
 - E.g., documents, authors, organization
- Display size (smaller or larger)
- Voice input and/or output
- Evaluation
 - Use many tools at many different stages
 - Details matter !!!

Alt UI Opportunities

- Web search still very simple
 - Querying ... a box
 - Presentation ... a list
 - Refinement ... try again
 - Almost no attention to the end-to-end search task

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- Web search still very simple
 - Querying ... a box
 - Presentation ... a list
 - Refinement ... try again
 - Almost no attention to the end-to-end search task
- Most innovations have not been widely adopted
 - E.g., suggested terms, graphical presentation of results
 - Grouping of results, an exception
 - Needs to be simple and quick, yet have big value